

Appln. No. 10/707,711

Docket No. 140021 / GEM-0094

**REMARKS / ARGUMENTS****Status of Claims**

Claims 1-24 are pending in the application and stand rejected. Applicant has canceled Claims 3, 5 and 13, has amended Claims 1, 4, 9, 10, 12, 21 and 23, and has added new Claims 25-26, leaving Claims 1, 2, 4, 6-12, and 14-26 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

**Rejections Under 35 U.S.C. §102(b)**

Claims 1-20 and 24 stand rejected under 35 U.S.C. §102(b) as being anticipated by Ono et al. (U.S. Patent No. 5,581,223, hereinafter Ono).

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

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Regarding Claims 1-11 Generally

Applicant has canceled Claims 3 and 5, and has amended Claim 1 to now recite, *inter alia*,

"A magnetic field generator... comprising:

...

***control electronics disposed within an electronics housing, the electronics housing being disposed outward of and proximal to the magnet housing;***

wherein the main magnet coils and shielding coils are configured to shape a magnetic field which comprises at least one low fringe field region when in operation, the at least one low fringe field region being at a location less than 2.5 meters radially from the center of the field of view and having a magnetic field strength low enough so as to not harm the electronics, ***the at least one low fringe field region including a region wherein the control electronics are located.***"

No new matter has been added as antecedent support for the amendment may be found in the specification as originally filed, such as at Paragraphs [0006], [0017] and [0019-0020] for example.

Dependent claims inherit all of the limitations of the parent claim.

In alleging anticipation, the Examiner broadly references Ono at column 7, lines 1-14, and remarks that Ono discloses electronics that may be safely placed at 2.06 meters from the center of the FOV. Paper 20050505, page 2.

At column 7, lines 1-14, Applicant finds Ono to disclose "...a computer or other equipment may be positioned outside the five gauss line 7D, being free from the effect of leakage flux."

At Figure 3, Applicant finds Ono to disclose the five gauss line 7D to be outboard from the self-shield 1D.

In comparing Ono to amended Claim 1, Applicant submits that Ono does not disclose each and every element of the claimed invention arranged as claimed. More specifically, Applicant submits that Ono does not disclose ***control electronics disposed within an electronics housing, the electronics housing being disposed outward of and***

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***proximal to the magnet housing and, the at least one low fringe field region including a region wherein the control electronics are located, which are specifically claimed for in the instant invention.***

In broadly alleging anticipation, the Examiner has not stated with specificity where each and every element of the claimed invention, arranged as claimed, may be found in Ono.

Absent anticipatory disclosure of ***each and every element arranged as claimed***, Ono cannot be anticipatory.

**Regarding Claim 2 Specifically**

The Examiner alleges that Ono anticipates Claim 2. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

***"The magnetic field generator of claim 1 further comprising negative coils to help shape magnetic field in the imaging volume."***

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

**Regarding Claim 4 Specifically**

The Examiner alleges that Ono anticipates Claim 4. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

***"...a gradient amplifier unit;  
an RF amplifier unit;  
a system controller; and  
a magnet monitor unit."***

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

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**Regarding Claim 9 Specifically**

The Examiner alleges that Ono anticipates Claim 9. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

**"...wherein the at least one low fringe field region comprises *a toroidal volume around the housing.*"**

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

**Regarding Claim 10 Specifically**

The Examiner alleges that Ono anticipates Claim 10. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

**"...wherein *the electronics occupies a toroidal volume around the housing.*"**

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

**Regarding Claims 12-20 Generally**

The Examiner alleges that Ono anticipates Claims 12-20. Paper 20050505, page 2.

Applicant respectfully disagrees.

Applicant has canceled Claim 13 and has amended Claim 12.

With specific regard to Claim 12, the Examiner alleges anticipation, but does not show with specificity where Ono discloses:

**"A magnetic resonance imaging system comprising:**

**...**

**electronics for operating the magnetic resonance imaging system, *the electronics located radially outward of the housing and proximal to the housing;***

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wherein the main magnet coils and shielding coils are configured such that they shape a magnetic field to comprise at least one low fringe field region when in operation; and

*wherein the electronics are located within the at least one low fringe field region."*

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

Dependent claims inherit all of the limitations of the parent claim.

Regarding Claim 14 Specifically

The Examiner alleges that Ono anticipates Claim 14. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

*"...a gradient amplifier unit;  
an RF amplifier unit;  
a system controller; and  
a magnet monitor unit."*

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

Regarding Claim 18 Specifically

The Examiner alleges that Ono anticipates Claim 18. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

*"...wherein at least one low fringe field region comprises a toroidal volume around the housing."*

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

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**Regarding Claim 19 Specifically**

The Examiner alleges that Ono anticipates Claim 19. Paper 20050505, page 2.

However, in making such an allegation, the Examiner does not show with specificity where Ono discloses:

“...wherein *the electronics occupies a toroidal volume around the housing.*”

In alleging anticipation, the Examiner must show where Ono discloses each and every element of the claimed invention arranged as claimed, which Applicant respectfully submits the Examiner has failed to do.

Absent anticipatory disclosure in Ono of *each and every element* of the claimed invention *arranged as in the claim*, Ono cannot be anticipatory.

By alleging anticipation absent specific reference to anticipatory elements that may be found in Ono, Applicant respectfully submits that the Examiner has failed to properly meet the burden of a showing of anticipation.

In view of the foregoing, Applicant submits that Ono does not disclose each and every element of the claimed invention arranged as claimed, and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) have been traversed, and requests that the Examiner reconsider and withdraw these rejections.

**Rejections Under 35 U.S.C. §103(a)**

Claims 21-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ono as applied to Claim 1 above, and further in view of Crozier et al. (U.S. Patent No. 5,818,319, hereinafter Crozier).

The Examiner acknowledges that Ono does not disclose the use of computerized optimization for determining coil positions for his magnet arrangement, and looks to Crozier to cure this deficiency. Paper 20050505, page 3.

Applicant traverses this rejection for the following reasons.

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Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest each and every element of the instant invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

Applicant has amended independent Claims 21 and 23 to now recite, inter alia,

“...defining fringe field requirements such that the low fringe field region is produced at a distance less than 2.5 meters radially from the center of the field of view and has a magnetic field strength that is low enough *so as to not harm the electronics*; and

running an optimization algorithm *to determine coil positions such that the low fringe field region, wherein the electronics may be located without being harmed, is proximal an outer surface of the magnetic field generator.*”

Dependent claims inherit all of the limitations of the parent claim.

In alleging obviousness, the Examiner references Crozier at Example 1, column 12, at columns 6-12 generally, and at the third paragraph of column 9 more specifically.

At Example 1, column 12, Applicant finds Crozier to teach “*simulated annealing procedures*”. (Line 64).

At Example 1, column 13, Applicant finds Crozier to teach a “final magnet design... [having a] *large number of coils* [that] were a result of the *simulated annealing procedure* and were not designated beforehand.” (Lines 13-18).

At column 6, Applicant finds Crozier to teach “the method aspects of the present invention relate to the use of an improved *simulated annealing procedure* to design magnets for magnetic resonance systems.” (Lines 23-26).

At column 9, Applicant finds Crozier to teach “Once the schedule and parameters are selected, the *simulated annealing* is performed until the system becomes ‘frozen’...” (Lines 48-53).

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At column 9, third paragraph, Applicant finds Crozier to teach "*the initial guess is used to calculate the fields outside of the magnet to determine the level of shielding provided by any shielding magnets included in the overall design.*" (Lines 20-23).

At column 10, Applicant finds Crozier to teach "Fig. 4 illustrates a preferred procedure for performing the *simulated annealing optimization.*" (Lines 1-2).

In considering the teaching of Crozier as referenced, Applicant submits that while Crozier may teach *a simulated annealing procedure that also calculates a level of shielding provided*, Applicant finds no teaching of performing the simulated annealing procedure *for the purpose of producing a low fringe field region that has a magnetic field strength low enough so as to not harm the electronics, and determining coil positions such that the low fringe field region, wherein the electronics may be located without being harmed, is proximal an outer surface of the magnetic field generator*, which is specifically claimed for in the instant invention.

In fact, and contrary to the claimed invention, Applicant finds Crozier to teach "*the development of short, yet homogenous, whole body magnets* for use in magnetic resonance imaging (MRI)." (Abstract).

In Crozier, Applicant finds no teaching of the problem associated with the use of electronics operating within a high field region, nor a teaching of a solution to that problem.

It is only in the instant application that one skilled in the art is taught of the problem associated with the use of electronics operating within a high field region, and a solution to that problem, thereby resulting in the advantage (also not taught in Crozier) of having electronics mounted directly on the housing of the magnetic field generator.

In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and are therefore wholly inadequate in their teaching of the claimed invention as a whole, fail to motivate one skilled in the art to do what the patent Applicant has done, fail to recognize a problem recognized and solved only by the present invention, fail to offer any reasonable expectation of success in combining the References to perform as the claimed invention



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performs, and discloses a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and respectfully request that the Examiner reconsider and withdraw these rejections.

**Regarding New Claims 25-26**

Applicant has added new Claim 25-26 that depend from Claim 1, and more specifically claim embodiments of the invention.

No new matter has been added as antecedent support may be found in the specification as originally filed, such as at Paragraphs [0019] and [0027], and at Figures 1-4 for example.

In view of the discussion relating to Claim 1, Applicant submits that new Claims 25-26 are directed to allowable subject matter, and respectfully requests entry and notice of allowance thereof.

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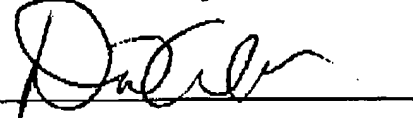
The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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